① $f(x) = \frac{2x}{x^2-1}$

VA: $x=-1$, $x=1$

$0 = x^2 - 1$

$0 = (x+1)(x-1)$

$0 = x+1 \quad 0 = x-1$

$x = -1 \quad x = 1$

HA: $y=0$

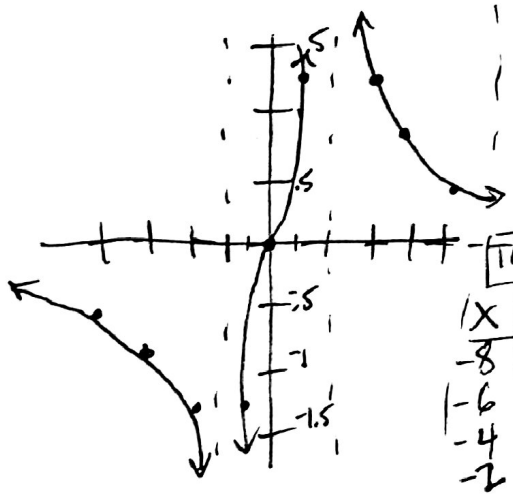
$m=1 \quad n=2$

$m<n \quad y=0$

Holes: none

Table:

x	-4	-3	-2	-.5	0	.5	2	3	4
y	-.55	-.75	-1.3	1.3	0	-1.3	1.3	.75	.53



$f(x) = \frac{6}{x+3} + 15$

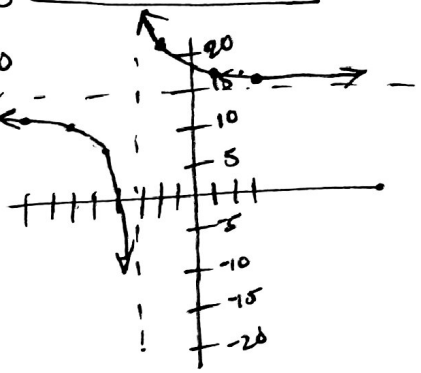
VA: $x=-3$

HA: $y=15$

holes: none

Table

x	y
-8	13.8
-6	13.0
-4	9
-2	21.0
1	16.5
3	16



② $f(x) = \frac{8}{x^2-x-6}$

VA: $x=2, x=3$

$0 = x^2 - x - 6$

$0 = (x+2)(x-3)$

$0 = x+2 \quad 0 = x-3$

$x = -2 \quad x = 3$

$\frac{2}{-} \cdot \frac{3}{-} = -6$

$\frac{2}{-} + \frac{3}{-} = -1$

HA: $y=0$

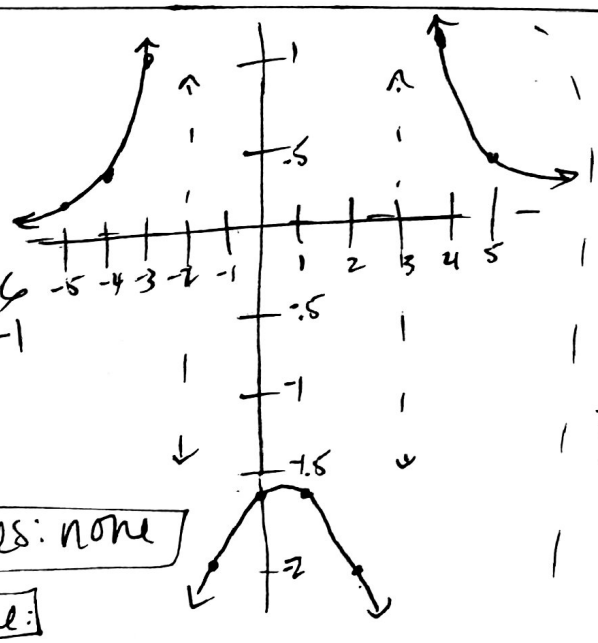
$m=0 \quad n=2$

$m<n \quad y=0$

Holes: none

Table:

x	-5	-4	-3	-1	0	1	2	4	5
y	.3	.5	1.3	-2	-4.3	-1.3	-2	1.3	.57



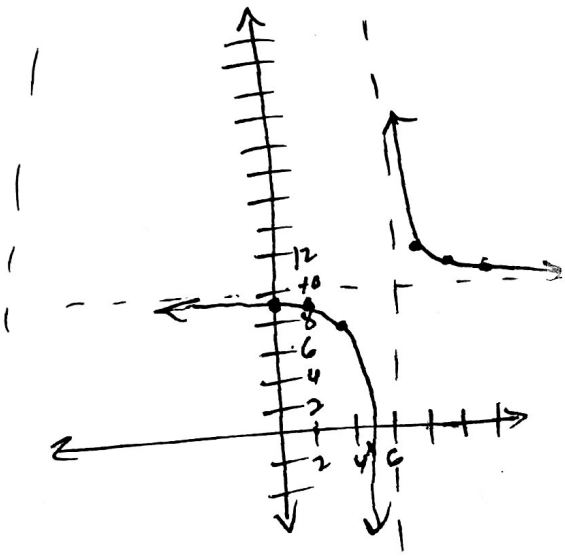
$f(x) = \frac{4}{x-6} + 10$

VA: $x=6$

HA: $y=10$

Table

x	0	2	4	8	10	12
y	9.3	9	8	12	11	10.6



③ $f(x) = \frac{x^2-9}{2x^2+1}$

VA: none

$2x^2+1=0$

$-1 \quad -1$

$2x^2 = -1$

$x^2 = -\frac{1}{2}$

none

Holes: none

HA: $y = \frac{1}{2}$

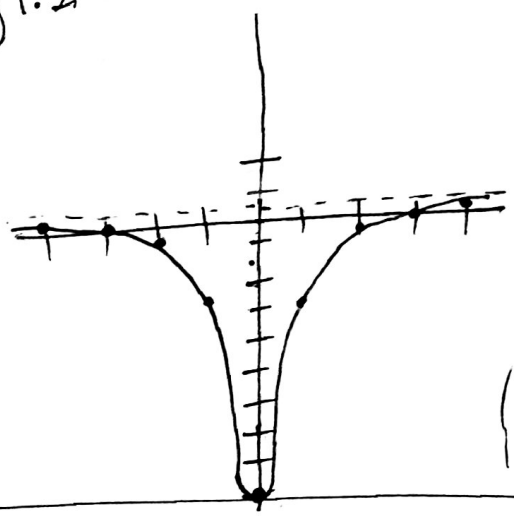
$n=2 \quad n=n$

$m=m$

$y=\frac{1}{2}$

Table

x	-4	-3	-2	-1	0	1	2	3	4
y	.2	0	-.5	-26	-9	-26	-.5	0	.2



$f(x) = \frac{1}{x-9} - 8$

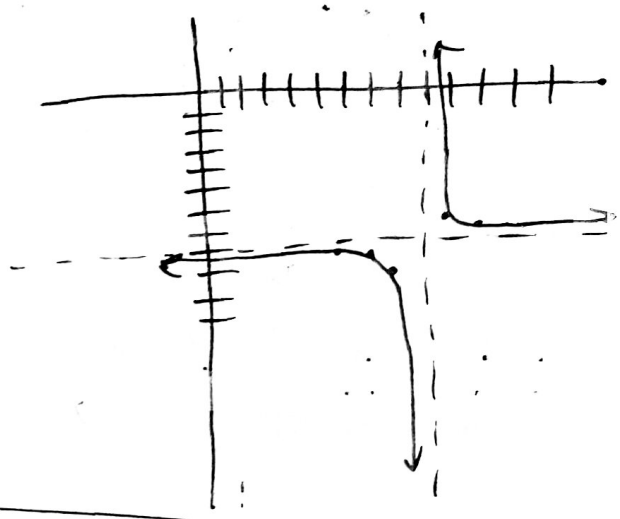
VA: $x=9$

HA: $y=-8$

Holes: none

Table

x	6	7	8	10	11	12
y	-8	-8.5	-9	-7	-7.5	-7.6



④ $f(x) = \frac{x^2-5x+6}{x^2-4x+3}$

VA: $x=1$, ~~$x=3$~~ not asym = hole

$0 = x^2-4x+3$

$0=(x-1)(x-3)$

$0=x-1 \quad 0=x-3$

$x=1 \quad x=3$

HA: $y=1$

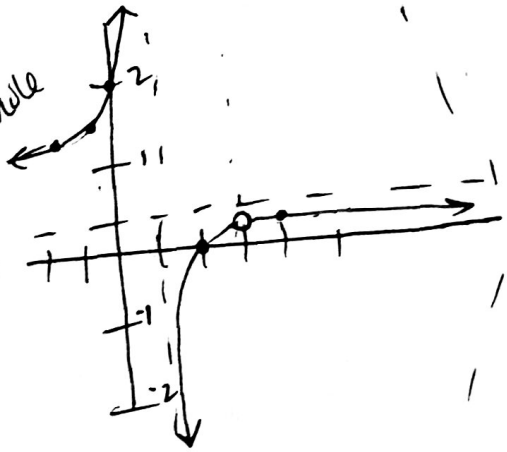
$n=2 \quad n=n$

$n=2$

$y=1$

Holes: $x=3$

$f(x) = \frac{(x-3)(x-2)}{(x-1)(x-3)}$



Table

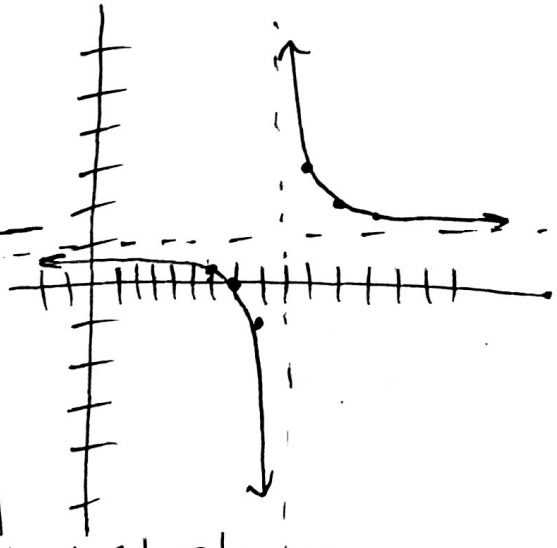
x	-2	-1	0	2	3	4
y	1.3	1.5	2	0	hole	.6

$f(x) = \frac{2}{x-9} + 1$

VA: $x=9$

HA: $y=1$

Holes: none



Table

x	6	7	8	10	11	12
y	3	0	-1	3	2	1.6

⑤ $f(x) = \frac{x^2+11x+18}{2x+1}$

VA: $x = -\frac{1}{2}$

$2x+1=0$

$2x=-1$

$x=-\frac{1}{2}$

HA: none

$n=2$ $n=1$

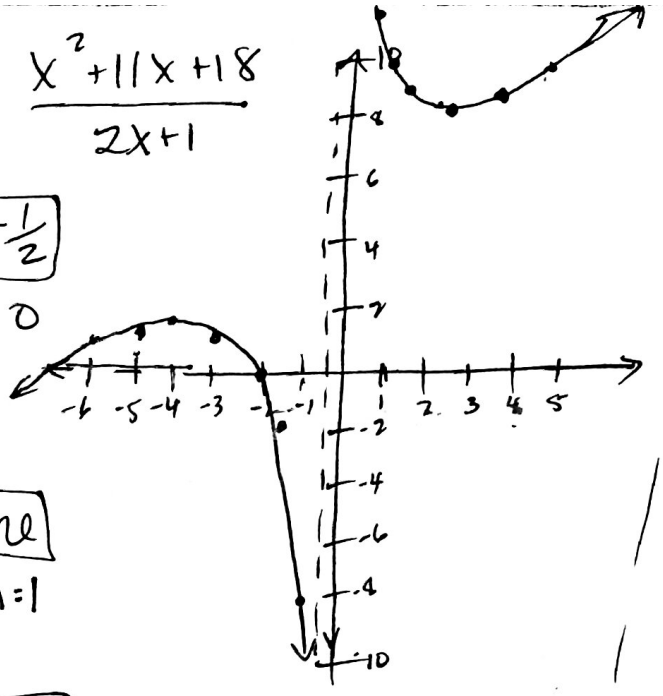
$m>n$

Holes: none

$f(x) = \frac{(x+9)(x+2)}{(2x+1)}$

$9 \cdot 2 = 18$

$\_ + \_ = 11$



Table

x	-2	-1.5	-1	0	.5	1	1.5
y	0	-1.8	-8	18	11.8	10	9.1

$f(x) = \frac{3}{x-8} - 12$

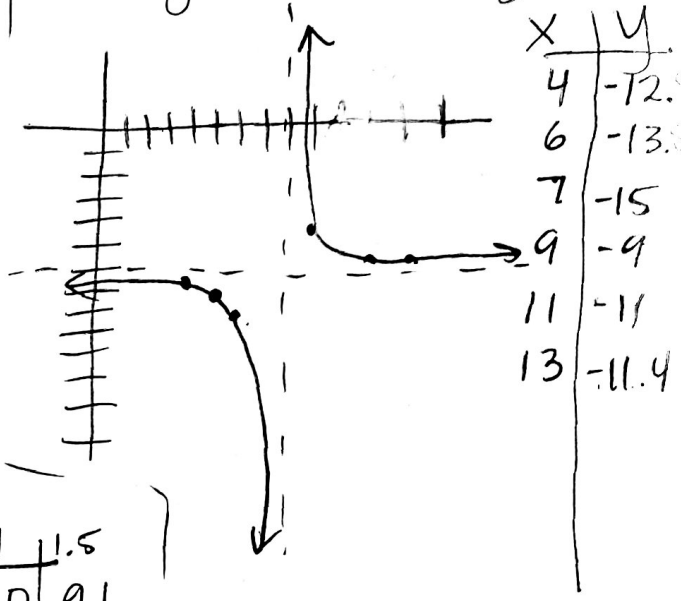
VA: $x=8$

HA: $y=-12$

Holes none

Table

x	y
4	-12.
6	-13.
7	-15
9	-9
11	-11
13	-11.4



⑥ $f(x) = \frac{x-4}{x^2-3x}$

VA: $x=0$ $x=3$

$0=x^2-3x$

$0=x(x-3)$

$0=x$ $0=x-3$

$x=3$

HA: none

$n=1$ $n=2$

$n<n$

Holes: none

$f(x) = \frac{(x-4)}{x(x-3)}$

Table

x	-3	-2.5	-2	-1.5	-1	.5	1	1.5	2.5	4	5	6
y	-.4	-.47	-.6	-.81	-1.25	2.8	1.5	1.1	1.2	0	.1	.1

$f(x) = \frac{4}{x} + 20$

VA: $x=0$

HA: $y=20$

holes: none

Table

x	-5	-2	-1	1	2	5
y	19.2	18	16	24	22	208